

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554**

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| In the Matter of |) | |
| |) | |
| Response Efforts Undertaken During 2017 |) | PS Docket No. 17-344 |
| Hurricane Season |) | |

**COMMENTS OF
NEPTUNO NETWORKS**

NEPTUNO MEDIA, INC. D/B/A NEPTUNO
NETWORKS

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SUMMARY

As one of the leading providers of wireless telecommunications services in Puerto Rico, Neptuno Media, Inc. d/b/a Neptuno Networks, submits comments in these proceedings focused on the impact of the storm on its network infrastructure, the Commission's response to the storm, and other recommendations for the Commission to consider in the long-term reconstruction of Puerto Rico's telecommunications infrastructure and the Commission's future role in natural disasters that affect telecommunications infrastructure in the future.

As the Commission is aware, the effects of Hurricane Maria on Puerto Rico were catastrophic, and Neptuno was not spared. The destructive impact of the storm's winds was felt immediately, as a number of structures on which Neptuno relies were damaged and equipment in network and customer sites was dislodged or blown away. Efforts to recover and reestablish service in the immediate aftermath of the storm were then hindered by two factors: (1) lack of access to the roads leading to network and client sites, which were often impassable and required assistance from the local government to be cleared, and (2) lack of commercial power—a problem that has lasted to this day, as at least half of Neptuno's sites continue to operate on backup generators. One of the lessons drawn from Hurricane Maria, and which is reflected in the two factors discussed above, is that providing resources to the telecommunications industry and restoring power to key areas for telecommunications networks was not treated by the local government and, specifically, the government-owned power utility in Puerto Rico, as a priority consistent with the critical nature of the services that Neptuno and the telecommunications industry offers.

Looking forward, Neptuno recommends that the Commission seek additional authority to be able to ensure that measures are being implemented at the local and state government level to

reestablish vital interstate communications services such as wireless voice and landline and wireless broadband service. The Commission also should consider being more proactive in incorporating smaller wireless providers in coordination efforts after a natural disaster and sharing more information regarding interoperability and available channels in spectrum that could be used in the short-term to speed the reestablishment of service.

The Commission also should take a decisive role in aiding the reconstruction of telecommunications networks in Puerto Rico. Small providers like Neptuno that have been severely impacted financially by Hurricane Maria would have benefited (and still would benefit) from short-term sources of funding to assist in keeping networks running in the face of extraordinary (and unexpected costs). The Commission also should establish a fund separate from the Connect America Fund for Eligible Telecommunications Carriers (“ETCs”) willing to rebuild the telecommunications infrastructure necessary to provide service in all areas of Puerto Rico.

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Neptuno Media, Inc. d/b/a Neptuno Networks (“Neptuno”), pursuant to Section 1.415(a) of the Commission’s Rules, 47 C.F.R. § 1.415(a), submits these Comments in response to the Public Notice issued by the Public Safety and Homeland Security Bureau on January 22, 2018.

I. INTRODUCTION

Neptuno is a leading wireless service provider based in Puerto Rico. Neptuno offers Layer 2 and Layer 3 MPLS VPNs services, Internet services, VoIP services, network consulting, integration services, and managed services to small and medium-sized businesses, government agencies, public and private educational institutions, and hospitals, as well as major enterprise customers that require an infrastructure capable of supporting their mission-critical business around Puerto Rico and the U.S. Virgin Islands. Since its foundation in June 2000, Neptuno has provided quality, reliable, and cost-effective solutions to its customers’ voice, data, and video requirements. Today, Neptuno has thousands of enterprise customers, including the major telecommunications carriers in Puerto Rico, and it has partnered with leading providers of WiMax-based wireless broadband equipment to develop a completely independent wireless backbone structure.

As the Commission is aware, the island of Puerto Rico experienced one of the most devastating natural disasters in its history when Hurricane Maria made landfall on September 20, 2017, as a Category 4 hurricane with sustained winds of 155 mph and even higher wind gusts. Like others in Puerto Rico, Neptuno and its teams of dedicated employees were deeply impacted by this catastrophic event and are still recovering from its destructive effects. Indeed, recent reports indicate that today—more than four months after Hurricane Maria made landfall—at least 45 percent of the island is still without power. Even as progress has been made, the challenges ahead remain daunting.

The telecommunications industry in Puerto Rico was extensively impacted by Hurricane Maria and it has not fully recovered. Neptuno's wireless networks was directly impacted on day one by the destructive effects of the forceful winds from the storm, the inability to access its network and customer sites due to impassable roads, and the lack of access to fuel to keep backup generators running. Even as access to sites and fuel improved in the days after the storm, it became clear that Puerto Rico would remain in the dark for months and that telecommunications networks in the island would have to continue running on backup generators for an extended period. To give the Commission a sense of the problem, 100 percent of Neptuno's network was running on backup generators in the days immediately after Hurricane Maria made landfall; today, more than four months after the storm passed, at least *half* of Neptuno's network sites continue to run on backup generators—all at a cost of millions of dollars in equipment and fuel. The principal cause of communications outages and network unreliability in Puerto Rico undoubtedly has been the continued lack of commercial power and long-term reliance on backup generators more than four months into the recovery from the storm.

Although much can be written about Hurricane Maria and its impact, Neptuno in these comments focuses on the impact of the storm on its network infrastructure, the Commission's response to the storm, and other recommendations for the Commission to consider in terms of the long-term reconstruction of Puerto Rico's telecommunications infrastructure and the Commission's future role in natural disasters that affect telecommunications infrastructure. Neptuno looks forward to engaging with the Commission on these issues and to further exploring long-term recovery efforts in Puerto Rico.

II. DISCUSSION

A. Impact to Communications Infrastructure

Neptuno's network and its ability to provide telecommunications service in Puerto Rico was impacted by Hurricane Maria from day one—and the effects are still being felt today, more than four months after the storm made landfall. The immediate impact of the Hurricane was felt in the damage to our network equipment from the 155 mph winds that came with the Category 4 storm. As a wireless-based provider—and one that relies heavily on point-to-point microwave communications—Neptuno relies on hundreds of antennas, tower structures, and customer premises scattered across the island where it collocates its equipment. Although parts of Puerto Rico suffered through floods as a result of the Hurricane, the most significant damage to our network during the storm came from wind—not rain or floods.

Hurricane Maria's winds wreaked havoc on both the provider side and client side of Neptuno's network. Neptuno relies on third-party towers and structures to deploy its cell sites, and the high winds destroyed and/or rendered unsafe more than 15 of these facilities. Even in sites where the tower structure was not compromised, Neptuno equipment sometimes was dislodged—and in certain instances blown away completely—by the high winds. Neptuno witnessed similar damage on the customer side of the network; in some instances the structures

where the equipment was installed suffered damages, while in others the antennas were dislodged. The destructive effect of the storm was such that even high-wind reinforced equipment that had been properly installed and secured to withstand a Category 4 hurricane were dislodged by the high winds.¹

Neptuno was able to make good progress repairing and (where needed) replacing this equipment—a process that was started the very day after Hurricane Maria passed. As explained below in more detail, accessing network sites and customer sites was a significant challenge in the immediate aftermath of the storm, and it did not normalize until many days later. Where access was possible, Neptuno's team was on the field repairing and reinstalling equipment diligently. In some instances that process was delayed by the need to order new equipment, particularly in those cases where customer premise equipment was damaged or destroyed and its replacement with newer equipment required us to also upgrade our network equipment on the other side of the point-to-point connection. The process overall was costly and time-consuming, but our equipment vendors were responsive and our team responded energetically and with a deep sense of commitment.

In the immediate aftermath of Hurricane Maria, two main factors combined to delay our ability to access our network infrastructure, assess the damage, and keep our network running: lack of access to roads and widespread lack of commercial power. The latter in particular turned

¹ Our experience also highlights the rather random nature of wind-driven damage in a storm such as Hurricane Maria. While the Hurricane impacted the entire island of Puerto Rico, the intensity of the winds was not uniform or consistent across the island—or even across a particular municipality. The areas near where the Hurricane made initial landfall and those that ended up close to the eyewall generally fared worse than other areas. And, predictably, Neptuno's network infrastructure in those areas generally suffered more wind-related damage. As a result, Neptuno encountered sites that were hit by wind gusts well in excess of 100 MPH, while others were mostly impacted by sustained winds of a much more reduced force. These unpredictable discrepancies from site to site put even more of an onus on accessing the sites and conducting a visual inspection quickly.

from a problem into a crisis, and it is still plaguing Neptuno and the Puerto Rico telecommunications industry more than four months days after the storm.

The first obstacle to Neptuno's recovery efforts in the immediate aftermath of the storm was lack of access to our network and customer sites. Access to remote sites, many of which are located in the mountainous interior region of the island, can be challenging even in ideal conditions; after Hurricane Maria, the roads leading to many of these remote sites were rendered impassable and were not cleared for days (and in some instances for months). But the accessibility problems were not limited to remote areas. In the days after Hurricane Maria's landfall even major roads in the heart of San Juan's commercial districts were inaccessible.

Neptuno's experience with the tower in Monte San Patricio was emblematic of the accessibility challenges that we faced. Monte San Patricio is a hill in the middle of a major commercial sector of San Juan with a prominent tower where all major wireless telecommunications service providers in Puerto Rico collocate their equipment. It took Neptuno's team two days to reach the top of Monte San Patricio even though it is flanked by major highways and lies within a 3-mile radius of the central offices of the majority of the telecommunications providers in Puerto Rico. Access to Monte San Patricio and many of the sites where Neptuno collocates required heavy machinery that Neptuno does not possess, which in turn required the intervention of the Puerto Rico government to assign crews equipped for substantial debris removal—all at a time when the government's resources were stretched thin and similar resources were being demanded by different local and federal government entities.

The end result was that, during a time when the government was pressing the telecommunications industry to reestablish telecommunications service and the people of Puerto Rico were rightfully demanding the ability to communicate reliably, Neptuno and others could

not access many of their sites and the local government did not treat the industry's request for assistance as a top infrastructure recovery priority. Precious days were lost on the recovery effort as a result.

The second obstacle to Neptuno's recovery efforts in the immediate aftermath of the storm—and one that still plagues Neptuno and others—was the lack of commercial power in Puerto Rico. As the Commission is aware, the entire island of Puerto Rico was in the dark immediately after the storm and large portions of the island remained in the dark for months. Even today close to 45 percent of the island remains in the dark.² Neptuno was ready to operate sites with generators in the immediate aftermath of the storm because it had acquired backup generators and was prepared to deploy them. The accessibility problems described above hindered those efforts. And even after those conditions improved, Neptuno and others in the Puerto Rico telecommunications industry confronted an additional problem: lack of reliable access to fuel to keep the backup generators running. In the immediate aftermath of Hurricane Maria access to diesel and other fuels were in short supply in Puerto Rico, and the local government restricted their distribution. Even when some fuel was obtained, distributing it around the island and maintaining fuel supplies required additional security that was difficult to acquire. The result: it took *weeks* for Neptuno and the telecommunications industry to secure reliable access to fuel to keep backup generators running. If the Commission wants the pinpoint the major factor that affected outages and resilience in the immediate aftermath of the storm, the

² See, e.g., Danica Coto, *More Equipment, Crews Head to Puerto Rico for Power Boost*, The Washington Post (Jan. 8, 2018), available at https://www.washingtonpost.com/business/technology/more-equipment-crews-head-to-puerto-rico-for-power-boost/2018/01/08/b5ae049a-f4d3-11e7-9af7-a50bc3300042_story.html?utm_term=.cf570ad61b84.

lack of reliable access to fuel for backup generators and the inability to safely distribute it across the island must be at the top of the list.

Neptuno understands that in the immediate aftermath of a natural disaster of Hurricane Maria's magnitude access to roads may be limited and dependence on backup generators becomes a necessity. What is not reasonable—and what neither Neptuno nor other providers in Puerto Rico were ready for—is to experience weeks and months without reliable access to commercial power. A full four weeks after Hurricane María made landfall, the “golden triangle” of telecommunications in San Juan—a four-square mile area where most major telecommunications providers in Puerto Rico have their central offices—was still without power, even as other commercial areas in San Juan were regaining power. It was not until a full-scale media campaign by the telecommunications industry and the combined pressure of the Commission and other federal agencies that the government-owned power utility in Puerto Rico finally agreed to prioritize this critical area.³ That still left Neptuno with a substantial number of cell sites relying on backup generators, but it at least helped to reduce reliance on them for our central office hub.

The unfortunate reality, however, is that today—more than four months after Hurricane Maria made landfall—the power situation has not been normalized. As mentioned earlier, 45 percent of the population in Puerto Rico still does not have power. And just last week the “golden triangle” against lost power, this time for various days. To this day, a large number of Neptuno network sites and customer sites continue to rely on generators for power; our estimate is that at least half of our sites continue to operate on backup generators—an unreliable and

³ See, e.g., *Puerto Rican Telecommunications Alliance Warns of Imminent Collapse*, Caribbean Business (Oct. 18, 2017), available at <http://caribbeanbusiness.com/puerto-rican-telecommunications-alliance-warns-of-collapse/>.

extremely costly source of energy. Worse, there is no end in sight to this widespread reliance on backup generators.

As the Commission appreciates, advanced wireless telecommunications networks such as Neptuno's are not designed to rely on backup generators for four months. Neptuno took measures to acquire hundreds of generators before the storm and has spent millions of dollars in equipment and fuel since then. But no contingency plan that Neptuno is aware of could have contemplated more than four months of reliance on backup generators, which, in any event, are not designed to operate continuously for such a prolonged period of time. As a result, the major cause of outages to Neptuno's telecommunications networks today continues to be lack of commercial power in Puerto Rico.

B. The Response of the Commission and Other Recommendations

Neptuno appreciates the active role that the Commission has played since even before Hurricane Maria made landfall in Puerto Rico. In the critical days after the storm passed, the Commission's Daily Communications Status Report provided vital information about the state of affairs in Puerto Rico when few other sources of reliable information were available. Neptuno also commends the Commission for its willingness to consider requests for special temporary authorizations on an expedited basis, for the availability and responsiveness of the members of the Hurricane Recovery Task Force, and for the Chairman's willingness to meet with Neptuno in person when he visited Puerto Rico in November.

Neptuno submits, however, that the Commission in the future should consider playing a different role—one that goes beyond coordination. Neptuno appreciates that the Commission's limitations in this regard may arise from statutory and jurisdictional restrictions rather than an unwillingness to play such a role, but any broader consideration of how to respond to similar

natural disasters in the future must consider a different role for the Commission, as discussed below.

First, the Commission should explore ways—including through statutory changes, if necessary—to be able to play a more authoritative role on behalf of the telecommunications industry when natural disasters impact telecommunications network in the devastating way in which Hurricane Maria impacted telecommunications in Puerto Rico. When a catastrophic natural disaster occurs, the Commission should be better armed (from a jurisdictional perspective) with the authority to ensure that measures are being implemented at the local and state government level to reestablish vital interstate services such as wireless voice and landline and wireless broadband service. Hurricane Maria illustrated that in the aftermath of a catastrophic natural disaster the telecommunications industry can easily be left without an authoritative voice that understands its needs and, more importantly, has the power to ensure that federal, state, and local authorities recognize that the networks of telecommunications are critical infrastructure in support of an essential service. Neptuno and the telecommunications industry certainly would have benefited from the intervention of a Commission with a clearer mandate and authority to ensure that telecommunications was treated as an essential service and to mandate access to the fuel needed to run backup generators immediately after the storm passed. Coordination with other agencies certainly helps, but it is no replacement for a clearer mandate to implement priorities in the aftermath of storms and other natural disasters.

Second, the Commission should consider proactively sharing with telecommunications providers more information in the aftermath of major storms regarding interoperable channel assignments and channels available for short-term use. In the immediate aftermath of natural disasters telecommunications providers—especially smaller providers like Neptuno—have

limited resources and time to determine which channels may be available for short-term point-to-point communications or to engage with spectrum coordinators. Releasing additional information, including information regarding emergency STAs that have been granted, would ease coordination and better allow providers to quickly deploy facilities.

Third, the Commission should consider establishing formal processes to ensure the inclusion from the outset of smaller, non-national providers in the meetings, conference calls, and other coordination efforts that the Commission leads. Neptuno and other small carriers played a critical role in setting up telecommunications capabilities for the command center that the government of Puerto Rico established in the convention center and assisted many of the larger carriers with short-term solutions to reestablish parts of their network. Despite playing this critical role, there appeared to be no formal procedures to ensure that all providers—including specifically smaller providers like Neptuno—were participating in the early coordination efforts with the Commission. The Commission should address that shortcoming in the future.

C. Other Recommendations

Focusing on longer-term recovery efforts, Neptuno recommends that the Commission consider the following:

- Neptuno recommends greater transparency and involvement of all stakeholders in the post-storm restoration process. This includes ensuring that all providers are given an opportunity to participate fully and improved coordination with the Commission and the Puerto Rico government on any efforts before Congress to secure additional funding for the reconstruction of Puerto Rico's telecommunications infrastructure.

- The Commission should consider establishing emergency funding programs to assist small providers in the aftermath of crippling national disasters. The experience of Hurricane Maria showed that small providers play a critical role in the post-storm recovery efforts, even as they are not as well-positioned as some of the larger national carriers to shoulder the costs involved in reestablishing a network, purchasing new equipment, paying for generators and fuel. The combination of millions of dollars in expenses to keep the network running on backup generators and the millions of dollars in consumer credits that it has been required to issue to call customers affected by the storm has pushed Neptuno’s financial resources to the brink. The Commission should explore, whether by its own authority or by working with Congress, the means for establishing programs that would activate during national disasters and provide direct, immediate assistance in the form of funding and/or special loans to small providers.
- The experience in Puerto Rico after Hurricane Maria illustrates the need for the Commission to continue making available new spectrum for wireless telecommunications. In emergencies like the one that Puerto Rico experienced after Hurricane Maria the ability to set up point-to-point wireless connections proved critical. As Puerto Rico rebuilds, last mile wireless connectivity also will likely prove to be critical in rebuilding networks and connecting people in remote areas. The Commission should continue to adopt frameworks that maximize both traditional licensing and spectrum sharing—and it should do so in a manner that allows both smaller carriers and national carriers to participate fully.
- The Commission should dedicate additional resources to Puerto Rico—beyond those already assigned under the Connect America Fund program—to ETCs to reestablish

service in remote and rural areas. The costs of rebuilding telecommunications networks in an island—and especially in remote mountainous areas—will be considerable, especially if the goal is to build a more resilient networks and continue to improve accessibility of affordable broadband. The dire economic conditions in Puerto Rico, which date to before Hurricane Maria made landfall, only add to the challenges involved with restoration of service across Puerto Rico. The Commission thus should establish a separate fund for ETCs willing to rebuild the telecommunications infrastructure necessary to provide service in all areas of Puerto Rico. In so doing the Commission should allow both landline and wireless providers to participate and recognize that wireless connectivity will be an essential part of any such recovery effort.

III. CONCLUSION

Neptuno appreciates the opportunity to share its experiences and recommendations to the Commission. The challenges that Neptuno and the telecommunications industry in Puerto Rico suffered were substantial, and there are important lessons to be learned. Neptuno looks forward to continuing working with the Commission, the government of Puerto Rico, and other stakeholders in this process.

Respectfully submitted,

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